

REMARKS

Applicants have carefully considered the February 28, 2006 Office Action, and the amendments above together with the comments that follow are presented in a bona fide effort to address all issues raised in that Action and thereby place this case in condition for allowance.

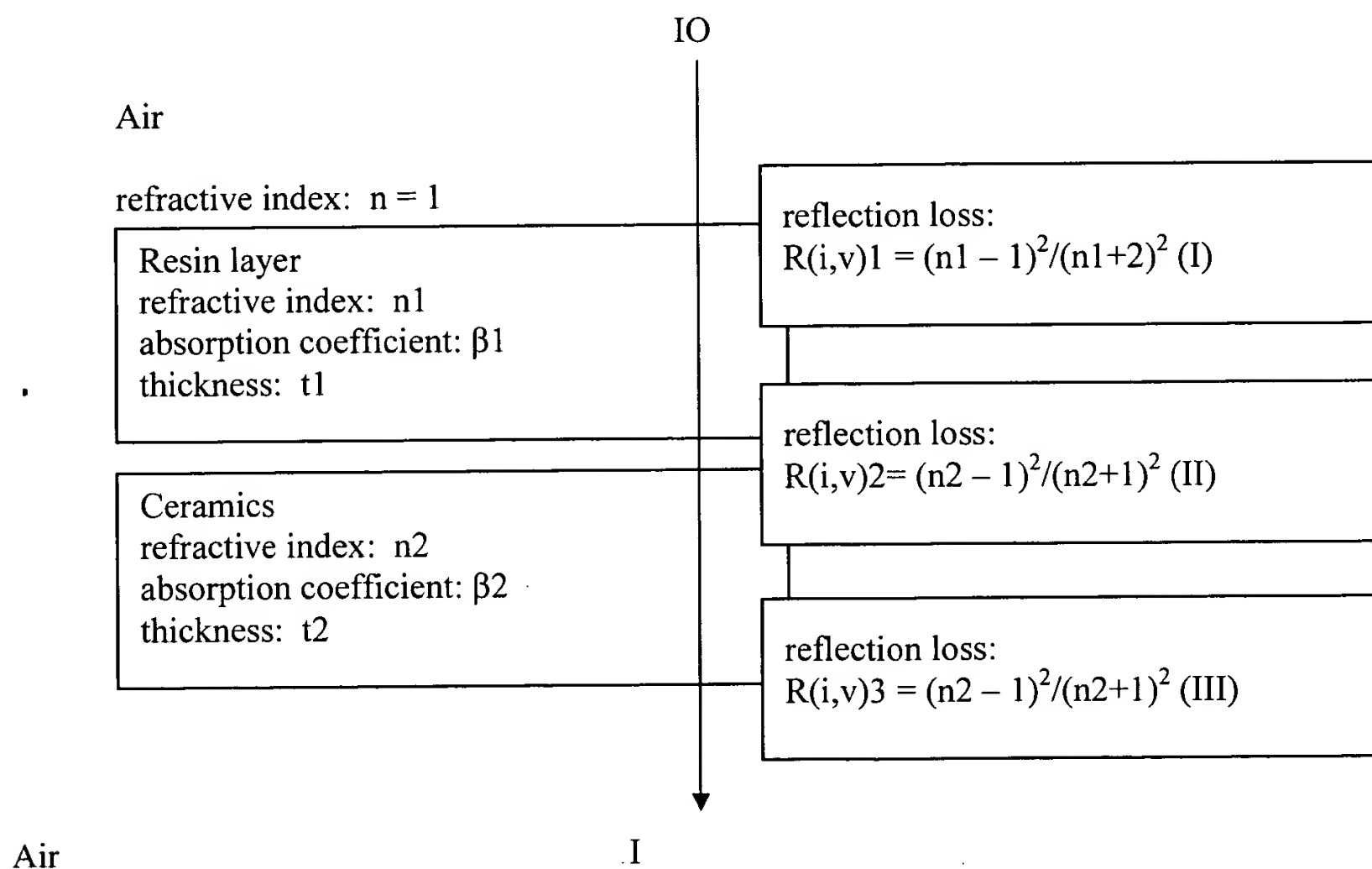
Claims 60-104 are pending in this application. In response to the Office Action dated February 28, 2006, claim 60 has been amended to address a minor informality identified by the Examiner. Hence the Amendment does not generate any new matter issue or any new issue requiring any further search and/or consideration. At the very least, the Amendment reduces issues for Appeal, by elimination the basis for an indefiniteness rejection. Accordingly, entry of the Amendment and prompt favorable reconsideration pursuant to 37 C.F.R. § 1.116 are respectfully requested.

Claims 60-63, 65, 66, 67, 68, 69, 74-78, 82-86, 93-98 and 104 stand rejected under the first paragraph of 35 U.S.C. § 112 as allegedly failing to comply with the written description requirement. The Examiner, at page 11 of the Office action, asserted that transmission measurements of optical components depend on a number of different factors. The Examiner argued that one of the critical factors is transmission at interfaces and that the transmission out of a glass surface into air would be different than the transmission out of the same glass surface into water. The Examiner argued that a lens body comprising a ceramic part and a resin layer have at least one additional interface between the ceramic and resin and, therefore, one of ordinary skill in the art would not simply multiply numbers from Tables 2 and 4 and compare this with Table 5 to derive the claim limitation at issue. Applicants respectfully traverse.

Applicants submit that in an actual operation of coating a resin cover, it is generally considered in the art that the resin layer and the ceramics do not form a complete contact but show a certain gap allowing a slight inclusion of an air layer. Applicants note that although the

applied prior references to Scherber and Castleman describe different methods (assembling and thermal adhesion), it is generally considered in the art that the resin layer and the ceramics do not form a complete contact but show a certain gap allowing a slight inclusion of an air layer. Thus, contrary to the Examiner's assertion in the February 28, 2006 Office action, a multiplication of  $T_i/T_v$  (ceramics) in Table 2 and  $T_i/T_v$  (resin) in Table 4 is proper (Applicants incorporate their arguments previously submitted on December 8, 2005). In the subject application, since the coating is executed by flowing a resin into a mold under a high pressure in the injection molding, such air layer is considered absent.

In general, a transmittance for a light passing through layers of different media is described below, utilizing a refractive index, an absorption coefficient and a thickness of each medium. The theoretical transmittance in the presence of a resin coating layer is as follows (See Fig. 1 of attached APPENDIX):



Transmittance:  $T\% - I/IO =$

$$(1 - R1)\exp(-\beta \cdot t1) \cdot (1 - R2)\exp(-\beta 2 \cdot t2) \cdot (1 - R3) \quad (1)$$

In the attached Fig. 1, the resins 1, 2 in Table 4 have a refractive index and an absorption coefficient as indicated below.

\* Resin 1:     refractive index  $n_i = 1.6 \rightarrow \beta_i = 1.013$ ,  
                   refractive index  $n_v = 1.5 \rightarrow \beta_v = 2.19$ ;

\* Resin 2:     refractive index  $n_i = 1.6 \rightarrow \beta_i = 8.07$ ,  
                   refractive index  $n_v = 1.5 \rightarrow \beta_v = 21.26$

The process of the above described calculation is based on the description in lines 6 to 10, right column, p. 77 of "SEI Technical Review No. 54, June 2002, Optical Characteristics of an Infrared Translucent Close-Packed ZnS Sintered Body" (a copy of this publication was previously submitted as Appendix B with response of December 8, 2005). The publication stated that that "the transmittance of infrared optical ceramics is given by the Lambert-Beer Equation, and if the material (i.e., refractive index) and thickness are specified, then the transmittance ( $T_i$  or  $T_v$ ) is determined by the absorption coefficient". The specific process is described below for the Examiner's consideration.

#### Procedure of Corrective Calculation

1. Absorption coefficients  $\beta_i$ ,  $\beta_v$  at each wavelength are determined by substituting, in the equations (2) and (11),  $T_i$ ,  $T_v$ , a thickness (3 mm) and a refractive index of ZnS at each wavelength ( $n = 2.28$  for  $T_i$  at a wavelength of 10  $\mu\text{m}$  and  $n = 2.31$  for  $T_v$  at a wavelength of 830 nm) shown in Table 2.

Example: Sample No. 2 in Table 2:

\*  $T_i = 52.1 \%$ , thickness = 3.0 mm, refractive index  $n_i = 2.28 \rightarrow \beta_i = 0.107$ ;

\*  $T_v = 0.016 \%$ , thickness = 3.0 mm, refractive index  $n_v = 2.31 \rightarrow \beta_v = 2.8$ .

Based on the foregoing, a total transmittance with a resin coating is calculated from the equation (1) in Fig. 1.

\* resin 1/ceramic 2: from (I):  $R_{i1} = 0.05$ ,  $\beta_i = 1.013$ ,  $t_1 = 0.05$ ;

from (II):  $R_{i2} = 0.03$ ,  $\beta_i = 0.107$ ,  $t_2 = 3$  mm;

from (III):  $R_{i3} = 0.15 \rightarrow T_i = 53.6$  %;

from (I):  $R_{v1} = 0.04$ ,  $\beta_v = 2.19$ ,  $t_1 = 0.05$ ;

from (II):  $R_{v2} = 0.05$ ,  $\beta_v = 2.8$ ,  $t_2 = 3$  mm;

from (III):  $R_{v3} = 0.16 \rightarrow T_v = 0.016$  %;

$\rightarrow T_i/T_v = 8441$  (1):

\* resin 2/ceramic 2:

from (I):  $R_{i1} = 0.05$ ,  $\beta_i = 8.07$ ,  $t_1 = 0.05$ ;

from (II):  $R_{i2} = 0.03$ ,  $\beta_i = 0.107$ ,  $t_2 = 3$  mm;

from (III):  $R_{i3} = 0.15 \rightarrow T_i = 37.7$  %;

from (I):  $R_{v1} = 0.04$ ,  $\beta_v = 21.26$ ,  $t_1 = 0.05$ ;

from (II):  $R_{v2} = 0.05$ ,  $\beta_v = 2.8$ ,  $t_2 = 3$  mm;

from (III):  $R_{v3} = 0.16 \rightarrow T_v = 0.006$  %.

$\rightarrow T_i/T_v = 6271$  (2):

\* From Table 5, No. 3,  $T_i/T_v$  (lens) = 4474;

$\rightarrow T_i/T_v$  being larger in comparison with (1):

From Table 5, No.6,  $T_i/T_v$  (lens) = 9889;

$\rightarrow T_i/T_v$  being larger in comparison with (2).

Applicants, therefore, submit that in view of the foregoing, one having ordinary skill in the art would have no difficulty understanding the subject matter of claims 60-63, 65, 66, 67, 68, 69, 74-78, 82-86, 93-98 and 104, particularly when reasonably interpreted in light of the written

description of the specification. The present disclosure conveys with reasonable clarity to those skilled in the art that the inventors were in possession of the invention. In other words, one skilled in the art, reading the original disclosure, would reasonably discern the limitation at issue in the claims. *Waldemar Link GmbH & Co. v. Osteonics Corp.*, 32 F.3d 556, 558, 31 UPSQ2d 1855, 1857 (Fed. Cir. 1994). Thus, the imposed rejection under the first paragraph of 35 U.S.C. § 112 has been overcome and, hence, Applicants respectfully solicit withdrawal thereof.

Claims 64, 78, 87-90 and 99-102 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tower et al. (U.S. Pat. No. 6,020,628, hereinafter "Tower") in view of Grossinger et al. (U.S. Pat. No. 5,712,622, hereinafter "Grossinger"); Silvestrini et al. (U.S. Pat. No. 4,323,619, hereinafter "Silvestrini") and Raj et al. (U.S. Pat. No. 5,183,602, hereinafter "Raj").

Claims 66, 67, 91 and 92 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tower in view of Grossinger, Silvestrini and Raj and further in view of Carnall, Jr. et al. (U.S. Pat. No. 3,131,238, hereinafter "Carnall").

Claims 68, 69, 91 and 92 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tower in view of Grossinger, Silvestrini and Raj and further in view of Roy et al. (U.S. Pat. No. 3,974,249, hereinafter "Roy").

Claims 64, 70, 71, 87-90 and 99-102 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Castleman (U.S. Pat. No. 6,153,881, hereinafter "Castleman") in view of Grossinger, Silvestrini and Raj.

Claims 72, 73 and 103 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Castleman in view of Grossinger, Silvestrini and Raj and further in view of Erismann (U.S. Pat. No. 5,818,337).

Claims 79 and 80 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Castleman in view of Grossinger, Silvestrini and Raj and in further in view of Adachi et al. (U.S. Pat. No. 4,302,674, hereinafter "Adachi").

Claims 81 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Castleman in view of Grossinger, Silvestrini, Raj and Adachi and further in view of Erismann.

Applicants respectfully request reconsideration and withdrawal of the rejections in view of the following remarks.

The Examiner stated that Silvestrini teaches carbon black of the MT type dispersed in an amount of 0.2% to 0.8% by weight. See pages 5 and 8 of the Office action. With respect to independent claims 99-102, however, the Examiner failed to identify where any of the applied references discloses or suggests a ceramic containing the specific pigments as disclosed in independent claim 99 and the specific amounts of carbon black and diamond in the claims 100-102. Thus, contrary to the Examiner's assertion at page 11 of the Office action, claim 99 recites specific pigments that are not taught in the applied art, and claims 100-102 further recite specific amounts of pigment (diamond and carbon black) not taught or suggested in the prior art. Thus, the rejections under 35 U.S.C. § 103(a) pertaining to independent claims 99-102 are not legally viable since the references alone, or in combination, fail to disclose every limitation of independent claims 99-102. The dependent claims are free from the applied art in view of their respective dependencies from independent claims 99-102.

Moreover, with respect to claim 99, the Examiner cites Grossinger and Silvestrini as allegedly teaching a visible light shielding by a uniform dispersion of an additive in a resin, and the prior art of Raj as teaching a dispersion of an additive (diamond) uniformly in ZnS. However, there is no prior art relied on by the Examiner teaching a visible light shielding effect by adding an additive to ZnS. Also, in the case of visible light shielding by adding an additive in

a resin, the light shielding property is determined only by absorption or scattering of the additive itself, while, in ceramics sintered at a high temperature, the light shielding property is influenced by the state of the additive, since the additive forms a solid solution in the crystalline lattice or that the band gap varies by a lattice strain. Thus, a visible light shielding property achieved by adding an additive to a resin is not directly applicable to ceramics, and the light shielding property cannot be attained by an infrared-transmitting additive such as diamond.

Applicants submit that claim 100 is patentably distinct over the applied art. The dispersion of carbon black as an additive in a resin is disclosed by Silvestrini, but the dispersion in ZnS is not disclosed in the prior art. While the prior art teaches dispersion in a resin, the subject application discloses dispersion of an additive in ceramics. In Table 1, Nos. 1-3 change the mixing method only for a same additive and a same blending ratio, in which a process A utilizing dry mixing is superior in the light shielding property  $T_i/T_v$  to a process C utilizing wet mixing, and a process B utilizing a preliminary crushing of the additive shows a drastically improved light shielding property  $T_i/T_v$ . Thus, a light shielding property is generated by adding a desired amount in ZnS.

With respect to claim 101, dispersing diamond as an additive in ZnS is disclosed by Raj. However, the amount of 0.001 - 1 wt% of diamond in the present claim is not disclosed or suggested. Moreover, the light shielding property is improved by the dispersion in ceramics.

With regard to claim 102, Applicants submit that, in addition to the arguments presented for claims 100 and 102, none of the applied references discloses dispersing both carbon black and diamond in ceramics, as claimed.

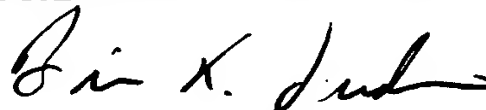
For the reasons advocated above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a).

It is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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Ceramics from Tab. 2										Resin from Tab. 4										Corrective calculation										Correction for refractive index										Calcd. Value			
ceramics					trans-mittance					ref. index					abs. coeff.					ref. index					obs. coeff.					corrected thick-ness					corrected trans-mittance					317/4000000 (mm)		317/4000000 (mm)	
Ti	Tv	ni	Bi	mi-1	Ti	Tv	ni	Bi	mi-1	Ti	Tv	ni	Bi	mi-1	Ti	Tv	ni	Bi	mi-1	Ti	Tv	ni	Bi	mi-1	Ti	Tv	R1i	R1v	R2i	R2v	R3i	R3v	Ti	Tv									
1	2	52.1	0.016	2.28	0.10719	2.31	2.800	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.02	87.8	89.2	0.05	0.04	0.03	0.05	0.15	0.16	55.3	0.017																	
2	2	52.1	0.016	2.28	0.10719	2.31	2.800	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.03	87.0	89.3	0.05	0.04	0.03	0.05	0.15	0.16	54.7	0.018																	
3	2	52.1	0.016	2.28	0.10719	2.31	2.800	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.05	85.2	82.8	0.05	0.04	0.03	0.05	0.15	0.16	53.6	0.016																	
4	2	52.1	0.016	2.28	0.10719	2.31	2.800	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.1	81	74.0	0.05	0.04	0.03	0.05	0.15	0.16	51.0	0.014																	
5	2	52.1	0.016	2.28	0.10719	2.31	2.800	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.11	80.2	72.4	0.05	0.04	0.03	0.05	0.15	0.16	50.5	0.014																	
6	2	52.1	0.016	2.28	0.10719	2.31	2.800	2	0.1	40	11	1.8	8.06840832	1.5	21.258	0.05	58.9	31.8	0.05	0.04	0.03	0.05	0.15	0.16	37.7	0.005																	
7	2	52.1	0.016	2.28	0.10719	2.31	2.800	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	45.0	0.013																	
8	12	26.1	1.15E-03	2.28	0.3376	2.31	5.213	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.05	85.2	82.8	0.05	0.04	0.03	0.05	0.15	0.16	26.9	0.000																	
9	12	26.1	1.15E-03	2.28	0.3376	2.31	5.213	2	0.1	40	11	1.8	8.06840832	1.5	21.256	0.05	59.9	31.8	0.05	0.04	0.03	0.05	0.15	0.16	18.9	0.000																	
10	12	26.1	1.15E-05	2.28	0.3376	2.31	5.213	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	27.5	0.000																	
11	18	70.8	12.1	2.28	0.049859	2.31	0.580	2	0.1	40	11	1.8	8.06840832	1.5	21.258	0.05	59.9	31.8	0.05	0.04	0.03	0.05	0.15	0.16	51.2	4.543																	
12	18	70.8	12.1	2.28	0.049859	2.31	0.580	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	61.1	9.491																	
13	19	53	0.095	2.28	0.101481	2.31	2.206	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	45.9	0.075																	
14	21	81.9	0.15	2.28	0.049739	2.31	2.054	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.05	85.2	82.8	0.05	0.04	0.03	0.05	0.15	0.16	63.7	0.146																	
15	21	81.9	0.15	2.28	0.049739	2.31	2.054	2	0.1	40	11	1.8	8.06840832	1.5	21.258	0.05	59.9	31.8	0.05	0.04	0.03	0.05	0.15	0.16	44.8	0.058																	
16	21	81.9	0.15	2.28	0.049739	2.31	2.054	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	53.4	0.118																	
17	28	71.3	13.5	2.28	0.002613	2.31	0.554	1	0.1	81	74	1.8	1.01271232	1.5	2.195	0.05	85.2	82.8	0.05	0.04	0.03	0.05	0.15	0.16	73.4	13.148																	
18	28	71.3	13.5	2.28	0.002613	2.31	0.554	2	0.1	40	11	1.8	8.06840832	1.5	21.258	0.05	59.9	31.8	0.05	0.04	0.03	0.05	0.15	0.16	51.8	5.089																	
19	28	71.3	13.5	2.28	0.002613	2.31	0.554	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	61.6	10.589																	
20	30	54.3	0.8	2.28	0.093404	2.31	1.498	2	0.1	40	11	1.8	8.06840832	1.5	21.258	0.05	59.9	31.8	0.05	0.04	0.03	0.05	0.15	0.16	39.2	0.300																	
21	30	54.3	0.8	2.28	0.093404	2.31	1.498	12	0.1	57	48	1.8	4.52689119	1.5	6.523	0.05	71.5	66.5	0.05	0.04	0.03	0.05	0.15	0.16	46.9	0.627																	

reflection loss:  
 $R(v) = (n_1 - 1/2)/(n_1 + 1/2) \cdot 01$

**Air** **in**

reflection loss:  
 $R(\nu)^2 = (n_2 - n_1)^2 / (n_2 + n_1)^2$  (1)

**Resistance layer**  
**relative index of refraction**

reflection loss:  
 $R_{\text{fl},v} = 1 - \frac{1}{2} \left( \frac{Z_2}{Z_1} + \frac{Z_1}{Z_2} \right)$

## Decorative index n2

**Fig. 1: Theoretical transmittance in the presence of a resin coating layer**